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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANDREA F. GULLA,
ROBERT J. ALLEN,
and EMORY S. DE CASTRO

Appeal 2009-005700
Application 10/830,182
Technology Center 1700

Before CHARLES F. WARREN, TERRY J. OWENS, and
PETER F, KRATZ, *Administrative Patent Judges.*

KRATZ, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1, 3, 5-7, 10, 12-22, 36-40, and 46-48. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

Appellants' claimed invention is directed to a catalyst, a gas diffusion electrode including such a catalyst, and a method of producing a gas diffusion electrode. Claims 1, 20 and 36 are illustrative and reproduced below:

1. An electrocatalyst for oxygen reduction comprising a cobalt and ruthenium sulfide supported on a conductive carbon black.

20. A gas diffusion electrode comprising a conductive web wherein the catalyst of claim 1 is applied on at least one face of said conductive web.

36. A method for producing a gas diffusion electrode of claim 20 comprising coating said conductive web on at least one side thereof with said catalyst optionally mixed with a first hydrophobic binder.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims (Ans. 3):

Kobylinski	3,840,389	Oct. 8, 1974
Lang	5,051,389	Sept. 24, 1991
Forquy	5,166,362	Nov. 24, 1992
Ito	6,649,300	Nov. 18, 2003

Reeve, R. W. et al., "Methanol Tolerant Oxygen Reduction Catalysts Based on Transition Metal Sulfides," Department of Chemistry, The University of Newcastle upon Tyne, United Kingdom NE1 TRU, 145 *J. Electrochem. Soc.* 3463-71 (Oct. 1998).

Appellants furnish a declaration under 37 C.F. R. § 1.132 by Giuseppe Faita as evidence in rebuttal.

The Examiner maintains the following grounds of rejection:

Claims 1, 3, 5-7, 10, 12, 13, 15-19, and 46-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Forquy in view of Lang and Ito. Claims 20-22 and 36-40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reeve in view of Forquy, Lang, and Ito. Claims 1, 3, 5-7, 12, 14-19, 47, and 48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobylinski in view of Forquy.

The principal issue before us is:

Has the Examiner erred by failing to establish that Forquy in combination with the other applied references teach or suggest the subject matter required by independent claim 1, which is common to all of the rejected claims?

We answer this question in the affirmative. Consequently, we reverse the stated rejections. Our reasoning follows.

All of the appealed claims require an electrocatalyst with a conductive carbon black support for cobalt and ruthenium sulfide or a method of making same.

Forquy is concerned with the manufacture of thiophene via catalytic dehydrogenation of tetrahydrothiophene. Forquy teaches that the catalyst can comprise ruthenium sulphide, optionally mixed with other transition metal sulphides and that the catalyst may be supported (abstract). Forquy teaches that the support can be alumina, silica, kieselguhr, titanium, zirconium oxide, silica-alumina, thorium oxide, or an active carbon (col. 2, ll. 27-30). Forquy teaches that the optional transition metal sulphide can be cobalt sulphide (col. 2, ll. 31-38). Forquy does not disclose that the support is conductive.

Lang is concerned with catalysts having hydrogenation activity that are useful in conducting hydroconversion and hydrotreating processes (abstract). Lang teaches that the metal component of the catalyst can be supported on a preformed carbon support that can be made with carbon black (col. 4, ll. 3-19).

Ito is directed to a platinum electrode catalyst useful in fuel cells, which catalyst includes a conductive carbon support (col. 3, ll. 40-46). Ito teaches that furnace black, acetylene black, and graphite powder having surface areas of from 60 through 1,500 meters squared per gram can be employed in forming the conductive carbon support (col. 3, ll. 49-59).

Reeve is directed to a transition metal sulphide electrocatalyst that is supported on a conductive carbon black support and the effect of methanol on the oxygen reduction performance of the catalyst (pp. 8-10).

Kobylinski is concerned with refractory oxide coating using metal sulfides, such as ruthenium sulphide, to impregnate the refractory and wherein activated carbon can be used as an alternative support for the formed catalyst (col. 1, l. 53 – col. 2, l. 17).

In the first stated obviousness rejection, the Examiner acknowledges that Forquy does not disclose a carbon black support for the dehydrogenation catalyst (Ans. 5). The Examiner turns to Lang and maintains that it would have been obvious to one of ordinary skill in the art to modify Forquy by substituting carbon black for the active carbon support of Forquy because both types of carbon are known catalyst supports. Then, the Examiner turns to Ito and, as best understood, urges that it would have been obvious to one of ordinary skill in the art to modify the Lang-modified Forquy by employing conductive carbons, as taught by Ito, as the modified

support of Forquy because the conductive carbons of Ito are considered equivalents to the carbon black of the modified Forquy (Ans. 6).

This rejection falls short of presenting a sustainable case of obviousness because the Examiner has not furnished a rationale basis for the proposed double substitution of the support materials of the dehydrogenation catalyst of Forquy based on the teaching of Lang with respect to support material used in forming a hydrogenation catalyst and the disparate teachings of Ito respecting the make-up of an electrode catalyst (App. Br. 6-8; Reply Br. 1-2). In this regard, we further note that Appellants' arguments that the active carbon employed by Forquy is a teaching of a non-conductive support for the dehydrogenation catalyst employed therein is substantiated by the declaration under 37 C.F.R. § 1.132 of Professor Faita (App. Br., Evid. Appdx.).[2]

In sum, the Examiner's argument that substitution of one known support for another is within the level of skill in the art is conclusory and is not accompanied by a rationale that indicates that one of ordinary skill in the art would have been prompted to modify the support of the dehydrogenation catalyst of Forquy based on the teachings with respect to supports for the other catalyst designs made for the different purposes of Lang and Ito.

Hence, we reverse the Examiner's first stated rejection.

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[2] Contrary to the Examiner's opinion (Ans. 11), the Declaration evidence was made of record prior to the relevant Final Office Action of Dec. 20, 2007 via operation of 37 C.F. R. §1.114 upon the filing of a Request for Continued Examination on June 11, 2007. This appeal was taken from the December 20, 2007 Final Rejection. The Examiner has considered this evidence (Ans. 11).

Concerning the Examiner's second stated rejection of claims 20-22 and 36-40, the Examiner relies on Reeve in addition to Forquy, Lang and Ito. This rejection suffers from the same basic deficiency as the first stated rejection in that the Examiner relies on a combination of Forquy, Lang and Ito for teaching the claim 1 limitations carried forward to rejected dependent claims 20-22 and as carried forward to method claims 36-40 drawn to preparing the catalyst of dependent claim 20 (Ans. 7). As urged by Appellants, the Examiner does not articulate how Reeve obviates this deficiency or otherwise furnish a rationale basis for modifying the electrode catalyst of Reeve based on the disparate teachings of Forquy directed to equivalent or alternative metals for use in a dehydrogenation catalyst (App. Br. 8 and 9; Reply Br. 4). Accordingly we also reverse the Examiner's second stated rejection.

Regarding the third obviousness rejection presented by the Examiner, the Examiner proposes a modification of the refractory or activated carbon supported catalyst of Kobylinski based on the dehydrogenation catalyst teachings of Forquy (Ans. 9 and 10). However, once again the Examiner' rejection falls short because the Examiner does not articulate a rationale basis for any modification of Kobylinski that would have been suggested to one of ordinary skill in the art based on the teachings of Forquy respecting dehydrogenation catalysts and that would have resulted in the claimed conductive carbon supported ruthenium sulfide and cobalt sulfide electrocatalyst (Reply Br. 5). Consequently, we reverse the latter rejection.

CONCLUSION/ORDER

The Examiner's decision to reject claims 1, 3, 5-7, 10, 12, 13, 15-19, and 46-48 under 35 U.S.C. § 103(a) as being unpatentable over Forquy in view of Lang and Ito; to reject claims 20-22 and 36-40 under 35 U.S.C. § 103(a) as being unpatentable over Reeve in view of Forquy, Lang, and Ito; and to reject claims 1, 3, 5-7, 12, 14-19, 47, and 48 under 35 U.S.C. § 103(a) as being unpatentable over Kobylinski in view of Forquy is reversed.

REVERSED

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